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Dairy Cattle Industry Launches National Health Project

Ian Rumbles, CanWest DHI, Guelph, Ontario

Dairy producers and veterinarians using Dairy Comp herd management software have been entering herd health information. Recently, field staff of CanWest Dairy Herd Improvement (DHI) have been collecting herd health information provided by the producer. For over a decade, whether entered by the producer or field staff, this health information has been uploaded into the Canadian DHI database.

In the past year, dairy industry partners worked to enhance collection of health data. The DHI system has been updated to include the calculation of health benchmarks, to create a summary report, and to implement a communication plan to inform producers and advisors about the collection of health data.

"Society is placing more emphasis on health, including wholesome food products from healthy cows. This cooperative industry project to develop a national dairy cattle health database is very timely," said Michael Hall, Chairman, Canadian Dairy Network. This information will be used by dairy producers, herd veterinarians and other advisors to make important herd management and culling decisions. In the future, we will also be able to calculate genetic evaluations allowing producers to breed for increased disease resistance."

The initial focus will be on eight key diseases identified by David Kelton, Kerry Lissemore, and Rochelle Martin. (Recommendations for Recording and Calculating the Incidence of Selected Clinical Diseases of Dairy Cattle. J Dairy Sci 1998; 81(9):2502-2509.) The diseases happen frequently in herds, can be consistently diagnosed, and have a significant impact on dairy herd profitability. The list includes mastitis, lameness, cystic ovarian disease, displaced abomasum, ketosis, metritis, milk fever, and retained placenta.

After consulting with veterinarians, there also will be emphasis on collecting information on animal injury, calf diarrhea, and calf pneumonia.

Producers will receive a laminated sheet providing definitions of the key diseases. The document can be seen online at http://www.valacta.com/sante_definitions_english.pdf. CanWest DHI encourages producers to work with their veterinarian to ensure consistent and on-going data collection. Veterinarians will receive a more elaborate definition of the diseases and background information on the project.

The national data management system places Canada among leading countries providing health management information and genetic evaluations to improve disease resistance.

The Canadian National Health Project was funded primarily by $600,000 provided by Holstein Canada as part of its allocation from Agriculture and Agri-Food Canada's *Sustaining the Genetic Quality of Ruminants Program*.

For more information on the project, veterinarians can contact DHI field staff or Ian Rumbles, CanWest DHI at 1-800-549-4373, extension 232.

Wanted: Sheep and Goats with Nasal Tumours

Sarah Wootton, Pathobiology and Paula Menzies, Population Medicine, Ontario Veterinary College (OVC)

Dr. Sarah Wootton, a virologist in the Department of Pathobiology, is studying the virus that causes nasal tumours in sheep and goats. Dr. Wootton is seeking donations of live sheep and goats with this disease.

Enzootic nasal tumours (ENT) are caused by a contagious retrovirus ENT-v. The adult sheep or goat presents with weight loss, normal temperature, nasal discharge (usually unilateral), and an increase in respiratory effort and noise on inspiration. On clinical examination, there can be decreased air movement from one nostril. Unilateral facial deformity may be evident. Initially the animal is bright with some appetite, but usually dies within 2 weeks of presentation. There is no treatment. Other diseases with similar presentation include nose bots, bacterial pneumonia and the respiratory form of Maedi-Visna. However, the facial deformity and unilaterally decreased air movement suggest ENT rather than these diseases.

Figure 1. A 2-year-old Dorset ewe with early signs of ENT. Her appetite was normal but there was increased respiratory noise and effort. Note the deviation of the nares.

The virus is contagious, so it is possible to have an incidence rate of 8 to 10% of the flock affected per year, but the disease can present sporadically as well. Dr. Wootton will be examining how the virus infects the sheep or goat and its effects on body organs other than the nasal cavity. She will also be working on developing a test to detect the presence of the virus in the peripheral blood so that eventually veterinarians will have a tool to help detect and remove infected animals before they develop tumours.

Figure 2. The same ewe as in Figure 1, 10 days later at post-mortem. She was euthanized because of loss of body condition. Note the size of the tumour and the extent of the facial deformity.

Dr. Wootton would greatly appreciate the help of Ontario practitioners in locating live sheep or goats with ENT. If you suspect a case, please contact Dr. Wootton (519-824-4120 ext 54729; kwootton@uoguelph.ca). Her project will arrange and pay for transportation of the live animal as well as compensation to both the producer and the veterinarian. The animal will be euthanized on arrival at OVC and necropsied. If you have any questions about this project, please do not hesitate to contact Dr. Wootton or Dr. Menzies (519-824-4120 ext 54043; pmenzies@ovc.uoguelph.ca).

Accurate and Complete Submissions Data are Important Contributions to Surveillance

Bruce McNab, OMAFRA, Jim Fairles and Beverly McEwen, Animal Health Laboratory (AHL)

Aggregate animal-health surveillance data are increasingly important to trade and the prioritization of research programs. They also help veterinarians place their client data into context. Surveillance was the theme of the Canadian Association of Veterinary Epidemiology and Preventive Medicine meetings recently held in Edmonton.

Diagnostic laboratory data are an important source of surveillance information. The Animal Health Laboratory's new Laboratory Information Management System (LIMS) and more extensive syndromic-coding of submissions will significantly enhance the surveillance system's ability to identify changes or trends in aggregate data at the farm, practice, and provincial levels.

It is recognized that laboratory submissions are not representative of the population. However, they do provide information on cases that veterinarians are sufficiently concerned about to submit samples. The accurate completion of ALL information, on each and every laboratory submission, is an important contribution submitters can make to their profession and clients, in support of industry and the public. This includes ALL submission form information concerning: clinic, farm premises, animal and sample identification; herd size, at-risk, sick and dead; date and duration of problem; breed, age, sex, body systems affected, reason for testing, and syndromic check-offs, etc. We request that you designate one or a few key people in your clinic to be responsible for ensuring that all AHL submission forms are completed accurately.

We recognize that, for logistical reasons, clinic personnel actually completing submission forms may not always be as familiar with the farm and case information as would otherwise be ideal. Also we recognize that the same premises may sometimes be recorded over time, as John Doe, or J. Doe, or Doe Farms, etc. Unfortunately, this can lead to erroneous counts of aggregate data in computer systems.

Starting this fall, new AHL submission forms will be distributed to take full advantage of the new AHL LIMS data system. Those forms will include a space to record a unique farm premises' ID number. We ask that you fill in a consistent unique premises' ID number or code in the premises' ID box on all submissions over time, from each unique farm premises. If appropriate, your clinic may choose to use its own unique farm premises' ID number system. When combined with your clinic ID in LIMS, this will produce a unique premises' ID, even if other clinics happen to use the same premises' number for one of their clients in another part of the province. Alternatively, in most cases, it may be appropriate to consistently use the ten-digit premises' phone number (land line) in the premises' ID box on the AHL submission forms. This has the advantage of being a unique premises' ID system that already exists, and for which people know their number. The purpose of this is NOT to enable the AHL or OMAFRA to phone farms directly, as we will always work through the submitting veterinarian if additional information is needed. However, for the purposes of accurately aggregating data over time, it will allow us and you (in most, but not all instances), to consistently group data from the same premises. This consistent unique premises' ID number (of your own creation or ten-digit phone number) will also allow the AHL to provide you with aggregate data about your clients and help you with easier electronic search capabilities.

Enlarged Sub-Maxillary Lymph Nodes in Swine

Tim Blackwell, Animal Health and Welfare, OMAFRA

The cervical lymph nodes of swine are routinely inspected at slaughter for gross abnormalities. Enlarged sub-maxillary lymph nodes, particularly if they contain multiple small abscesses, are associated with *Mycobacterium avium* infection. When enlarged lymph nodes are observed in the sub-maxillary region at slaughter, the head is condemned as unfit for human consumption because of the possibility that the gross lesions indicate *M. avium* infection.

M. avium is an endemic infection in many species of birds. The organism is passed in the feces. If pigs are exposed to birds or bird feces, infection of the sub-maxillary and occasionally mesenteric lymph nodes can occur. Pigs have an increased risk of *M. avium* infection if they have access outdoors, are in barns with resident bird populations, drink water from a surface water source, or if straw or peat moss are used in the production system.

Recently, Dutch researchers were surprised to find that the prevalence of sub-maxillary lymph node enlargement had not changed dramatically over the years during which pig production had shifted to total confinement in bird-proof buildings with little or no straw in the production system. They identified nine farms with particularly high rates of sub-maxillary lymph node enlargement ranging from 2.3 to 5.7%. They examined 1,276 pigs from these nine farms and found 98 pigs with enlarged sub-maxillary lymph nodes (7.7%) and one with enlarged mesenteric lymph nodes (0.1%). *M. avium* could not be identified from any of the 99 pigs with enlarged lymph nodes. However the bacterium *Rhodococcus equi* was isolated from 44 of the 98 enlarged sub-maxillary lymph nodes. *R. equi* was also isolated from two mesenteric lymph nodes that were among 159 grossly normal lymph nodes collected from 61 pigs from these same nine herds.

This study suggests that, although the prevalence of enlarged sub-maxillary lymph nodes in slaughter swine in the Netherlands is not decreasing, the prevalence of *M. avium* infection in market hogs is declining. It is likely that infection of market pigs with *R. equi* is at least partially responsible for the on-going observation of enlarged sub-maxillary lymph nodes in market hogs in the Netherlands.

Currently, there are indications of a possible increase in cervical lymph node enlargement in Ontario slaughter swine. The exact cause of this increase is under investigation.

Komijn RE et al. Granulomatous lesions in lymph nodes of slaughter pigs bacteriologically negative for Mycobacterium avium subsp. avium and positive for Rhodococcus equi. Vet Microbiol 2007; 120(3-4):352-7.

Congenital Splay Leg in Piglets

Janet Alsop, Animal Health and Welfare, OMAFRA

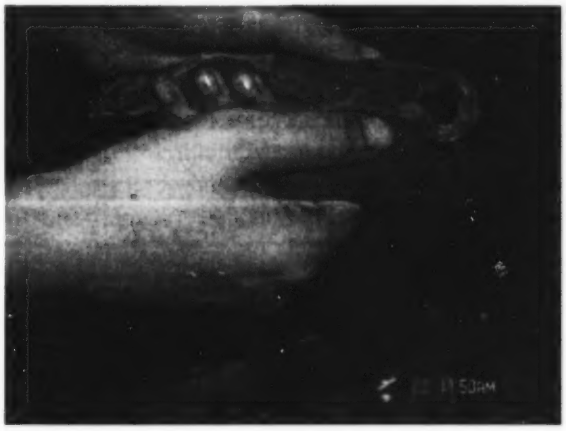
The splay-leg syndrome is a common but sporadic condition in newborn piglets. Typically, only a few piglets in a litter are affected. Affected piglets are unable to stand and their hind limbs are splayed sideways or forwards. Occasionally, the forelimbs are also splayed. There is a high-case fatality rate because the affected piglets are prone to crushing, chilling and starvation. Higher frequencies have been observed in male piglets[1] and the incidence is highest in Landrace pigs[2], suggesting a hereditary predisposition. The current hypothesis is that the condition has a

multifactorial etiology. Research has focused on identifying the existence of one or more major genes that may be associated with congenital splay leg. In addition, environmental factors, such as slippery floors, may contribute to development after birth, and the splay-legged condition has been associated with ingestion of zearalenone-contaminated feed during gestation[1].

The pathological basis of the condition is poorly understood, but investigations have demonstrated an immaturity of the skeletal muscle at birth[3]. Myofibrillar hypoplasia is present in all splay-legged pigs but this may also be present in unaffected littermates[3]. However, the arrangement of the myofibrils within the muscle bundles is different in affected and unaffected piglets[2]. In splay-leg piglets, there is a higher content of RNA in the sarcoplasm and the extramyofibrillar space is filled with glycogen, indicating a difference in glycogen metabolism in the first 2 to 3 days of life[2].

Epithelial protein lost in neoplasm (EPLIN), a cytoskeleton-associated protein initially identified as a gene product in human cancer cells[4], may play a role in muscle development. It has been found to be preferentially expressed in the muscle of splay-legged piglets, but not in the muscle of unaffected piglets[5]. The research in this field may form the basis for investigations into the genetic basis of congenital splay leg.

If the piglets are assisted with nursing or if they are hand fed for several days, approximately 50% will recover by 5 to 7 days of age. Survivors may have a lower weight at weaning compared with their littermates[1] due to their decreased ability to access a teat. Taping the hind limbs of affected piglets at birth with duct tape, electrical tape or adhesive tape will increase mobility and survival. The tape should be removed within 48 to 72 hours. If there is no improvement at that time, the affected piglet should be humanely euthanized.



Massaging the affected limbs is an under-utilized technique. Massage should be performed as soon as piglets are identified and can be done in conjunction with the taping. The piglet should be held by both hind legs and the pelvic and leg muscles vigorously massaged for 10 to 20 seconds. This should be repeated 3 to 4 times during the first 24 hours. After each massage the piglet should be placed by the sow's udder and assisted to nurse. It is assumed that massage increases blood flow to the muscles, thus stimulating the development of the muscle fibres. Anecdotally, massaging affected piglets has been credited with improving survival rate.

1. *Straw BE, Zimmerman JJ, D'Allaire S, Taylor DJ. Diseases of Swine, 9th ed. Victoria, Australia: Blackwell Publishing, 2006:88-89, 923, 1003.*
2. *Radostits OM, Gay CC, Blood DC, Hinchcliff KW. Veterinary Medicine, 9th ed. Edinburgh: WB Saunders Company Ltd., 2000:1800-1801.*
3. *Curvers P, Ducatelle R, Vandekerckhove P, De Coster W, Calus A, Hoorens J. Morphometric evaluation of myofibrillar hypoplasia in splayleg piglets. Dtsch Tierarztl Wsch 1989; 96 (4): 189-91.*
4. *Maul RS, Chang DD. EPLIN, Epithelial protein lost in neoplasm. Oncogene 1999; 18(54):7838-7841.*
5. *Wang H, Wang H, Zhu Z, Yang S, Feng S, Li K. Characterization of porcine EPLIN gene revealed distinct expression patterns for the two isoforms. Anim Biotechnol 2007; 18(2):101-108.*

Umbilical Hernias in Swine: Non-surgical Repair Techniques

Danielle Cardinal, summer student, and Janet Alsop, Animal Health and Welfare, OMAFRA

Umbilical hernias in swine occur when abdominal connective tissue fails to close around the umbilical ring. In pigs, the condition may be hereditary, although infection of the umbilical cord also predisposes to the development of hernias. The reported frequency of umbilical herniation in swine ranges from 0.4 to 1.2%.

Pigs with umbilical hernias are often sold at a lower price, or are sent to slaughter at a younger age, causing economic loss to the producer. Hernias can increase the risk of mortality, as intestinal contents can become strangulated in the hernial ring. The Canadian Food Inspection Agency's Compromised Animal Policy forbids the transportation of pigs with umbilical hernias that interfere with walking, that touch the ground or that are ulcerated, necessitating special transport arrangements for affected pigs. Large umbilical hernias cause problems in processing plants because the intestines may adhere to the lining of the umbilical sac, resulting in tearing and spillage of intestinal contents. When this occurs, the line must be stopped while carcasses and equipment are cleaned.

Umbilical hernias are often not detected until the pigs are 9 to 14 weeks of age, when the increased weight of abdominal contents causes them to be evident. Prevention of umbilical infections at birth may reduce the incidence of umbilical hernias. Disinfecting umbilical cords has been reported to decrease infections. In addition, improving farrowing-crate sanitation by removing accumulated sow manure before farrowing and using a desiccant powder to keep the crate floor dry may reduce bacterial levels in the piglet's environment, thus reducing the risk of umbilical infection and umbilical hernias.

Hernias can be surgically repaired by a veterinarian. However, this is seldom cost effective. Non-surgical treatment is more desirable. A recent report from Pollicino *et al.*[1] suggested that Elastrator® bands could be used to successfully repair hernias in gilts.

On two Ontario swine farms, we evaluated three non-surgical methods of hernia repair in 20 to 40-kg gilts with reducible umbilical hernias. A large size Elastrator® applicator was used to apply either Elastrator® rings or Tri-band® rings because a regular size Elastrator® applicator did not fit over the hernial sacs. A third method involving Elastoplast® tape was also evaluated.

Since the pig needs to be relaxed in order to replace the intestinal contents in the abdomen, we evaluated several sedative and anaesthetic combinations. In their work, Pollicino *et al.*[1] used 1.8 times the label dose of azaperone (Stresnil), which is licensed in Canada for tranquilization of swine. We found that, even at three times the label dosage, the pigs were not subdued enough to permit us to apply the Elastrator® rings properly.

In an effort to find a better anaesthetic, a ketamine, xylazine and butorphanol combination, administered at 0.2 ml/kg IM, was used. An excellent plane of anaesthesia was achieved. However, since neither ketamine nor butorphanol is licensed for use in food animals, these drugs can not be used on Canadian Quality Assurance (CQA)-validated farms.

The third combination evaluated - xylazine (0.66mg/kg IM), followed 10 minutes later by azaperone (8.8 mg/kg IM, four times the label dosage) - provided adequate sedation and is CQA-compliant.

Results varied. In the first five animals treated with rings or tape, we did not achieve acceptable results since the rings were not placed correctly due to inadequate sedation (azaperone only) and the tape was chewed off by the other pigs in the pen.

At the second farm, one gilt was treated with a Triband® ring, and a second was treated with two Elastrator® rings (Figure 1). When the animals were re-examined eight weeks later, the hernia in the first animal was still present, but reduced in size, and the hernia in the second animal appeared to have resolved (Figure 2). We felt that we obtained better results in these animals because we were able to sedate them fully, using xylazine and azaperone. During a subsequent visit to the same farm, a 15-kg gilt was treated with Elastoplast® tape covered with physiotherapy tape, without sedation. (Physiotherapy tape is an extremely sticky tape used in the treatment of muscle injuries). Because the farm owner was able to segregate this animal, the tape remained on for at least five days before falling off. On examination two weeks later, there did not appear to be any reduction in the size of the hernia.

Figure 1: Sedated gilt immediately following placement of two Elastrator® rings.

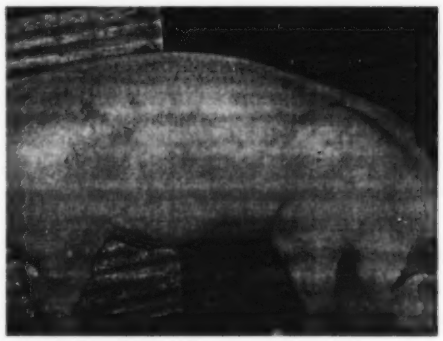


Figure 2: Gilt one month following treatment with two Elastrator® rings (not the same animal as in Figure 1).

At present, a consistently effective non-surgical method for repairing umbilical hernias in swine has not been established. We found that the dosage of azaperone recommended by Pollicino *et al.* (4 mg/kg)[1] was insufficient. Administering xylazine followed by four times the label dosage of azaperone resulted in adequate sedation. Elastoplast® tape, Elastrator® rings, and Tri-band® rings may serve as possible non-surgical repair methods. However, all methods required more than one person to apply the treatment and may be too time consuming for producers to employ. If affected gilts can be placed in a hospital pen for 5 to 7 days after treatment with Elastoplast® tape or Elastrator® rings, or if umbilical hernias are identified at a younger age, treatment success may improve. Investigations of effective non-surgical hernia repair treatments are ongoing.

1. *Pollicino P, Gandini M, Perona G, Mattoni M, Farca A. Use of Elastrator® rings to repair umbilical hernias in young swine. Journal of Swine Health and Production. 2007; 15:92 -95.*

Roughage Benefits Rumen Development in Milk-fed Calves

Neil Anderson, Animal Health and Welfare, OMAFRA

In Ontario, it is common advice to feed grain and withhold roughage to stimulate rumen development in milk-fed, dairy replacement calves. Some producers follow the advice while others ignore it and provide dry hay. Recently, researchers in the Netherlands used veal calves in a study that showed advantages of dried grass and other roughages in the diet.

Table 1 (below) is taken from the Dutch research paper. Bull calves (64) received milk replacer plus one of eight dietary treatments. Concentrate was in pellet form and roughages were chopped. They restricted six of the diets to 750g dry matter per day and two were ad libitum. At 10 weeks, they euthanized and examined the calves.

Data in the table show advantages of grass hay in development of healthy rumen mucosa and minimizing plaque formation on the lining. (Plaque = rumen mucosa containing focal or multifocal patches with coalescing and adhering papillae covered by a sticky mass of feed, hair and cell debris.) For example, Table 1 shows 38% of veal calves fed only concentrate (C100 dietary treatment) with their milk replacer had poor development of rumen mucosa. In comparison, all calves fed 70% concentrate plus 30% dry-grass hay (C70-G30 treatment) had normal rumen development. Although not shown here, the researchers found 'that in veal calves, the addition of roughage to concentrate diets did not affect growth performance'.

Table 1. Effect of dietary treatments on the incidence of poorly developed rumen mucosa and the incidence of plaque formation (macroscopic)

Variable	Dietary treatment[1]							
	C100	C40-CS60	C70-S30	C70-G30	C70-CS30	C70-G15-S15	C70-CS30-AL	C70-G15-S15-AL
Plaque, % of calves	100[a]	63[a]	13[b]	13[b]	88[a]	50[ab]	0[b]	0[b]
Poor development of mucosa, % of calves	38	25	25	0	0	0	0	0

[a,b]Means in the same row with different superscript differ significantly ($P<0.05$; nonparametric analysis; Fisher's exact test).

[1]Treatments:
C100=concentrate only;
C40-CS60=concentrate (40%) with corn silage (60%);
C70-S30=concentrate (70%) with straw (30%);
C70-G30=concentrate (70%) with dried grass (30%);
C70-CS30=concentrate (70%) with corn silage (30%);
C70-G15-S15=concentrate (70%) with dried grass (15%) and straw (15%);
C70-CS30-AL=concentrate (70%) with corn silage (30%) fed ad libitum; and
C70-G15-S15-AL=concentrate (70%) with dried grass (15%) and straw (15%) fed ad libitum.

Although this research pertains to bull calves, one should expect comparable rumen development in heifer calves on similar diets. Ontario contrarians who feed hay appear to be making a good choice for their calves. They should expect normal development of rumen mucosa in all their calves. Producers who feed only grain, grain plus corn silage or grain plus free-access straw bedding should expect normal development in 62-75% of their 10-week-old calves. With this research in hand, producers should question the dogma about feeding only grain to milk-fed calves. Grain is essential to rumen development, but some dry hay assures healthy rumen growth.

Suarez BJ, Van Reenen CG, Stockhofe N, Dijkstra J, Gerrits WJJ. Effect of roughage source and roughage to concentrate ratio on animal performance and rumen development in veal calves. J. Dairy Sci. 2007; 90(5):2390-2403.
Abstract: http://jds.fass.org/cgi/content/abstract/90/5/2390

Normal Rumen Development in Calves on Free-access, Acidified Milk Replacer

Neil Anderson, Animal Health and Welfare, OMAFRA

Doubters believe a calf's rumen will not develop properly on free-access, acidified-milk feeding schemes. Their proof is a photograph from a Penn State website[1] that shows lack of development of rumen mucosa in a calf fed *only* milk. Free-access, acidified-milk feeding *is not* milk-only feeding. Calves on the system have free-access milk plus grain, hay or combinations. Since there were no reports of development of rumen mucosa in free-access, milk-fed calves, I collected rumens of calves reared on the feeding system.

Figure 1. Free-access feeding system.

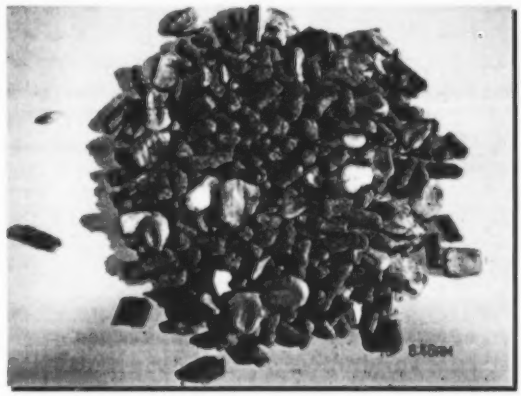


Figure 2. Grain mixture fed to calves.

An Elmira-area dairy producer raised the study calves in group pens with wood shavings for bedding. Their diet consisted of free-access, acidified (pH 4-4.5) milk replacer (20% protein:15% fat) mixed at 150 g/L, free-choice water, and free-choice supplement pellets (20% protein) with rolled corn. Figure 1 shows the housing and milk-feeding system and Figure 2 shows the grain mixture.

At the age of 24, 31, 38 and 65 days, four bull calves were transported to the Animal Health Laboratory, University of Guelph, for euthanasia and post mortem. Figures 3, 4, 5 and 6 show the ventral rumen of the four Jersey calves. Macroscopic examinations showed normal rumen mucosa in all calves. There are papillae in various stages of development and a linear arrangement as seen in a normal rumen. There were no control calves for comparison. However, in the future, a formal research project will provide those data and photos.

Now, when doubters tell me rumens will not develop, I say, "I used to believe that too, but I don't any more. The calves look good, have above-average growth, and their rumens develop normally." I hope you find the information useful and share it with your clients. The photographs will be available on OMAFRA's website in November.

Figure 3. Rumen at 24 days.

Figure 4. Rumen at 31 days

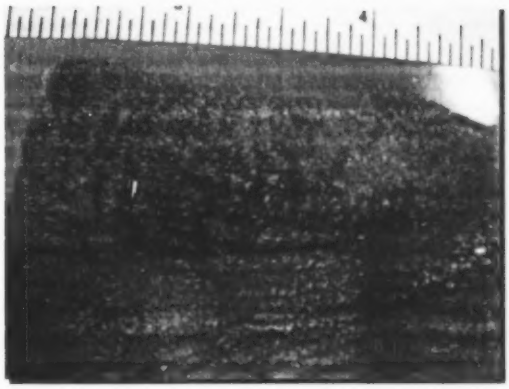


Figure 5. Rumen at 38 days.

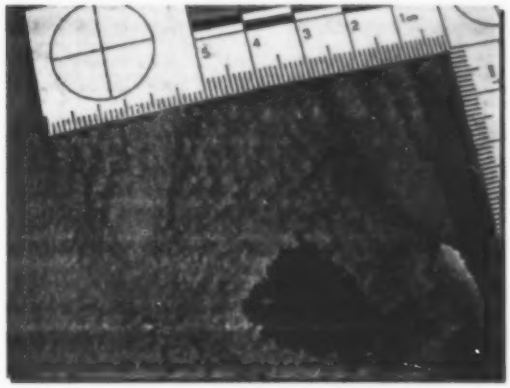


Figure 6. Rumen at 65 days.

Acknowledgements

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1. *Calf Rumen Images. Penn State, College of Agricultural Sciences, Department of Animal Science.* http://www.das.psu.edu/dairynutrition/calves/rumen/

Calves with Wet Umbilical Cords May be Risky *Round-trippers*

Neil Anderson, Animal Health and Welfare, OMAFRA

A toughening of sales-barn inspections could give some neonatal dairy calves, rightly or wrongly, an unexpected round-trip ride on sale day. For their safety and well-being, calves less than 8 days of age are not eligible for transport and sale. A wet umbilical cord is all an inspector needs to exercise his or her authority to order a calf returned home. A wet umbilical cord may be a crude indicator of age but, currently, it is the only available method for estimating the age of very young calves.

A weigh inspector employed by the sales barn has the job of examining calves entering the barn. This inspector identifies animals for examination by a private veterinary practitioner who then makes the final decision concerning their eligibility for sale.

There are no historical data showing the frequency of calves with wet cords presented to, or rejected from, Ontario sales barns. Recently, there have been allegations that too many young calves are being moved and sold. Efforts to examine this complaint generated the following information.

During the June 4th sale at VanKleek Hill, an inspector found 14 of 70 calves (20%) with wet umbilical cords. Owners of two of the 14 admitted their calves were 3 days old. During three successive weeks at the Listowel sales barn, nine, seven and eleven calves could have been sent home based on cord evaluation. Overall, twenty-seven of 430 calves could have been rejected at the Listowel sales. Wet cords may be more frequent at some sales barns than others.

At a dairy farm this summer, we found bull calves greater than 8 days of age with wet cords suggesting that factors other than just age could affect cord drying.

Producers take some risk accepting a calf back home, especially when it has been transported or housed with calves of unknown health status. The real risk to home-farm cattle of round-trip calves is unknown and probably varies amongst farms.

An obvious way to prevent hazards associated with *round-trippers* is to keep calves with wet navels home in the first place. Owners or truckers could inspect cords and make the decision on the farm of origin before loading the calves. Practitioners could provide producers with information about care for umbilical cords, sales-barn regulations, risks of bringing home disease, and isolation facilities for round-trippers. Lastly, a certificate of age verification may be something for industry leaders to consider.

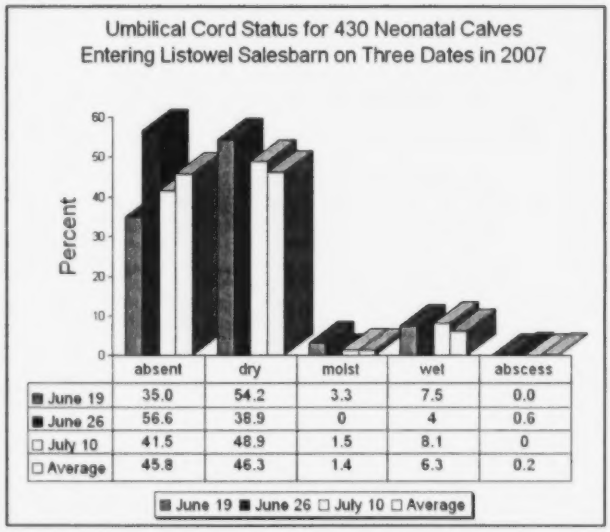

Figure 1. Data from the Listowel sales barn show 6.3% of calves (27) could have been sent home because of wet umbilical cords during three sales in the summer of 2007. Note the weekly variation in frequency of wet navel cords.

Acknowledgements

Thank you to three people who made this report possible. From the Listowel Veterinary Clinic, Rod Wieringa facilitated the Listowel study and Annette Terpstra examined the calves. Ed Bailey, OMAFRA, provided findings from VanKleek Hill.

Prevention of *Staphylococcus aureus* Infections in Dairy Cattle

Danielle Cardinal, summer student, and Ann Godkin, Animal Health and Welfare, OMAFRA

The use of bactericidal teat-dipping solution has been proven to reduce the incidence (new infection rate) of intramammary infections. However, some confusion about how teat dipping works still seems to exist among producers and this may contribute to poor teat dipping procedures. Recently, during a farm investigation where bulk tank SCCs had increased to penalty range, we found that 15% of the milking herd was infected with *Staphylococcus aureus (SA)*. The herd had a history of low SCCs. In the course of the investigation the herd owners reported that all teats were dipped post-milking using an appropriate iodine teat-dipping product. In spite of this, infection had spread aggressively over a short time period.

Indepth investigation of milking procedures identified that some of the milking personnel had changed recently. The new milker had been instructed to only dip the tip of the teat. This had been recommended to the producer and the milking staff as a cost-saving method by a product salesperson when a new teat-dip product had been purchased.

For teat dip to prevent the transfer of *SA* infection, all four teats must be appropriately covered with dip after each and every milking. *SA* is a contagious mastitis pathogen. It lives primarily on the surface of the skin of the udders and teats of cows infected with *SA* mastitis. It can be carried from one cow to the next at milking time by contamination of anything that moves from one cow to the next. The major route of spread for *SA* occurs when liners carrying a small film of milk and *SA* move from an infected cow to an uninfected cow milked next in the order. *SA* can transfer from the infected cow's udder to the teat skin of the new cow. If allowed to persist on the teat skin, colonization of the skin can occur over time. Colonization may occur within hours of transfer. The "great leap forward" of infection spread occurs once the skin of the next cow is contaminated. Over time, *SA* will be carried from the surface of the teat skin to within the gland by milk or water, or, may even multiply sufficiently to invade the teat end without assistance. Eventually mastitis results.

The objective of post-milking teat disinfection is to kill *SA* and other mastitis pathogens that may have been left on the skin after the liners are removed. Post-milking teat dipping therefore must cover the entire surface of the teat skin that was in contact with the unit's liners to be sure of eliminating all the *SA* that may have come from the previous cow. Post-dipping allows a long contact time between skin and disinfectant, which results in a good bacterial kill.

Post-milking teat disinfection is the *single most effective practice* for reducing the spread of *SA* mastitis. Ontario surveys have shown that over 90% of dairy herds have at least one cow infected with *SA* at any given time, and are therefore at risk of having *SA* spread if teat dipping is not performed adequately. *SA* mastitis unfortunately responds poorly to treatment once infection is established. Prevention of new infections with *SA* is the key to maintaining a low infection rate.

The remedy for the current herd was to hold a milking school. All persons milking on the farm (days and weekends) attended a short meeting to review the need for good milking procedures and to ensure they understood how post-milking teat dipping worked.

Reviewing milking practices on a farm annually is a good way for a veterinary practitioner to ensure that consistently good milking practices are adopted all the time by everyone involved in milking cows. It's not just what they do but how they do it that is of equal importance.

1. *Teat Disinfection Facts. January, 1999.* www.nmconline.org
2. *Post-milking Teat Disinfection Factsheet. 2007.* www.nmconline.org
3. *Kirk J. Principle-Based Mastitis Prevention.* www.vetmed.ucdavis.edu/vetext/INF-DA/INF-DA_PRINMASTITIS.HTML

Coxiella burnetii - Another Reason Not to Drink Raw Bovine Milk!

Ann Godkin, Animal Health and Welfare, OMAFRA

Dairy cattle can be a reservoir of *Coxiella burnetii*, a zoonotic rickettsial organism that is the cause of Q fever in people.

Roughly half of the people who become infected with *C. burnetii* will become acutely sick. Clinical signs include a high fever, headache, muscle aches, chills, sweats, coughing, chest pain and nausea. Up to half of the people who show clinical signs go on to develop pneumonia; most will also develop some degree of hepatitis. The majority of people recover although the illness can last for several weeks. Only 1 to 2% of people who develop Q fever die from the disease. Rarely, chronic Q fever can develop among people that have predisposing conditions, such as pre-existing cardiac valve problems, renal failure or cancer. Illness lasts for months. Secondary problems such as endocarditis can develop. While rare, up to 65% of people with chronic Q fever can die.

People can be exposed to *C. burnetii* when in contact with an environment contaminated by infected animals. Most often sheep and goats are found to be the source. Although *C. burnetii* is a cause of abortion in sheep and goats, cattle too can frequently be infected but will show no signs. The organism is rarely associated with abortion in cattle. The occurrence of *C. burnetii* infection in cattle in Canada has not been well studied. One serological survey of 200 Ontario dairy herds in 1988, suggested that up to 67% of those herds were positive[(1)].

Infected cattle, sheep and goats shed the organism in milk. Inhalation or aspiration of the organism when raw milk is consumed is one route of exposure for people. Very few organisms are needed to form an infective dose.

Researchers from Cornell University[(2)] have developed a PCR test for *C. burnetii*. They used the test on 316 convenience samples of bulk milk from Eastern U.S. dairy herds, collected over a 3-year period (2001 to 2003). Of these samples 93.4% tested positive. There was little variation in the rate of positive tests over the 3-year period and little variation regionally. This suggests that the infection rate in the cattle population remained stable and high.

Infection of people from commercially pasteurized milk is unlikely to occur. However raw milk consumption has been linked to high rates of positive serological tests among people. Exposure to infected animals or their environment has resulted in clinical illness.

1. *Lang GH. Q fever: an emerging public health concern in Canada. Can J Vet Res 1989; 53:1-6.*
2. *Kim SG, Kim EH, Lafferty CJ and Dubovi E. Coxiella burnetii in bulk tank milk samples, United States. Emerging Infectious Diseases 2005; 11(4):619-21.*

High Total Bacterial Counts are Common in Free-stall Bedding

Neil Anderson, Animal and Health and Welfare, OMAFRA

In human medicine, there is a notion that 'dirt' plays a useful role in our immune systems. The newest advice is to let our children get dirty to avoid a growing list of diseases. In udder health management, we still accept *the germ theory*, believing that dirt (more specifically, bacteria) is the cause of mastitis. Hygienic practices are used to ensure health and healthy living for cows and their caregivers, and quality milk.

Study farms in this report were a convenience sample located close to Fergus. We collected bedding samples daily (June 25-29) from the same stalls within 17 free-stall barns. We picked bedding from six sites within each stall and took care not to collect manure.

Farms 10, 1, 7 and 4 achieved consistently low bacterial counts each day (data not shown). Other farms had day-to-day variation in counts, perhaps related to addition of new bedding or a sanitizer.

The data provide some insight into 'bacterial' cleanliness in bedding on a few Ontario farms, use of bedding sanitizers, and success of efforts to provide clean, dry bedding for dairy cows. Although some environmental hazards cannot be changed, producers showed they can enhance bedding cleanliness by their choices and management practices. When confronted with outbreaks of environmental mastitis, we depend upon knowledge in the *germ theory* to focus our control efforts. Hygiene of bedding should be high on the list.

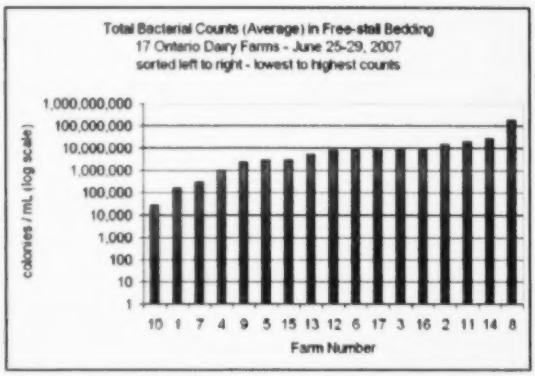

Figure 1. Average bacterial counts in bedding ranged from 27,000 to 185 million cfu / mL. Bedding from 13 of 17 farms had total bacterial counts greater than one million cfu / mL.

Farm	Bedding	Stall Treatment
10	straw	Lime Daily 1x
1	straw	Formaldehyde Daily
7	shavings	Stalosan® Weekly
4	shavings	Lime Daily 1x
9	straw	Lime Weekly
5	shavings	None
15	shavings	Lime Weekly
13	straw	None
12	shavings	None
6	shavings	None
17	straw	None
3	straw	SOP® Weekly
16	shavings	None
2	straw	None
11	shavings	None
14	shavings	None
8	sand	Lime Daily 2x

Table 1. Farm identification number, bedding type and stall treatments (sanitizer) used on 17 farms with bedding culture results shown in Figure 1.

Acknowledgements

Danielle Cardinal, summer student, did the field work and entered data. Dr. Anna Bashiri, Guelph, did the bacterial cultures. Dr. Ken Leslie, Ontario Veterinary College, facilitated the laboratory work. Harbro LTD., UK provided funding for cultures.

Continuing Education/Coming Events

Water Quality Meetings in Ontario

Guy Seguin, Farm Systems and Management Specialist, Dairy Farmers of Ontario

If the water you use to wash your milking equipment doesn't meet the potability standards of the Canadian Quality Milk (CQM) program, Dairy Farmers of Ontario (DFO) will be holding a meeting that you should attend. DFO is organizing four meetings across the province in October that will feature experts on various aspects of water quality. Topics will include water testing, well maintenance, shocking wells, surface-water challenges and overall best management practices. At the end of the conference, a producer should know how to maintain and take care of his well, how to site a well and, if necessary, which water treatment is right for the farm.

DFO is implementing potable water standards under the CQM program in January 2008. They will be phased in over four years. Water used to wash milking equipment must meet the standard of zero coliforms and zero *E. coli*. DFO has been testing water yearly since October 2003 and results so far show that more than half of the province's producers don't have a water source that meets the standard. Correcting water-quality issues will require a different approach on each individual farm. In some cases, it could be as easy as applying best management practices on farm wells and water resources. On other farms, issues are more complicated. The meetings are part of an on-farm, water-treatment-demonstration project. It will also feature magazine articles, brochures and step-by-step presentations. This project is funded in part by the Canadian and Ontario governments under the Canada-Ontario Water Supply Expansion Program [COWSEP], an initiative of the Agricultural Policy Framework. The Agricultural Adaptation Council administers COWSEP on behalf of the federal and provincial governments.

Scheduled meeting dates and locations are: Oct. 23, Maxville Sports Complex, Maxville; Oct. 24, Belleville ON at the Fairfield Inn & Suites; Oct. 25, Brantford at the Best Western Brant Park Inn; Oct. 26, Listowel Agricultural Hall. All meetings run from 9:30 a.m. to 3:00 p.m. It is necessary to pre-register before October 12, 2007. The cost is $25 per person for DFO producers and $50 per person for all others. Lunch is included. Call Guy Séguin 613-764-5568 for more information. Everyone is welcome.

Sheep Udder Health Day—November 3, 2007

Jocelyn Jansen, Animal Health and Welfare, OMAFRA

Ontario is hosting the 13th Annual Great Lakes Dairy Sheep Symposium at the Ramada Inn in Guelph, November 1-3, 2007. On Saturday November 3rd, there will be a special continuing education session on managing udder health. Dr. George Fthenakis, a world-renowned, small-ruminant, mastitis specialist from the University of Thessaly, Greece, will be the key speaker. Other topics that day include parlour sanitation and hygiene and lamb-health management. A special 1-day registration is available for veterinarians. For the full symposium agenda and registration form, please visit the Dairy Sheep Association of North America website at http://www.dsana.org/ or phone OMAFRA's Agricultural Information Contact Centre 1-877-424-1300.

Continuing Education/Coming Events

Sept. 29, 2007	8th Annual OVC Animal Welfare Forum Focusing on Global Issues, Lifetime Learning Centre, University of Guelph, Guelph, Ontario. www.ovc.uoguelph.ca/Associations/AWC/2007/index.html
Oct. 18, 2007	Ontario Agri-Business Association and Ontario Association of Swine Veterinarians 2007 Joint Swine Technical Meeting, Arden Park Hotel, 522 Ontario St., Stratford, Ontario www.oaba.on.ca/
Oct. 23-25, 2007	Cornell Nutrition Conference. East Syracuse, New York. www.ansci.cornell.edu/dm/cnconf/ Contact: Heather Fredenburg, (607) 255-2060, Fax: (607) 255-1335, dmconf@cornell.edu
Nov. 1-2, 2007	Equine Practitioners Conference, College of Veterinary Medicine at Cornell University, New York State Veterinary Medical Society. Registration deadline: October 1, 2007. www.vet.cornell.edu/extension/conedu (607) 253-3200, Fax: (607) 253-3198
Nov. 1-3, 2007	Western Canadian Association of Swine Veterinarians Annual Meeting Saskatoon, Saskatchewan. Contact: Anne Ruholl, (306) 966-7267; Fax: (306) 966-7274, anne.ruholl@usask.ca
Nov. 8-9, 2007	Iowa State University 15th Annual Swine Disease Conference for Swine Practitioners, Ames, Iowa. www.ucs.iastate.edu/mnet/swinedisease/ (515) 294-6222; Fax: (515) 294-6223, ucs-info@iastate.edu
Nov. 12-14, 2007	Penn State Dairy Cattle Nutrition Workshop, Holiday Inn, 604 Station Rd., Grantville, Pennsylvania. www.das.psu.edu/dairynutrition/education/workshop2007/ Contact: Coleen Jones, (540) 997-5809, Fax: 540-997-5809, cjones@psu.edu
Nov. 15-16, 2007	Central Canada Veterinary Association Conference. Strathmere Inn, 1980 Phelan Rd, W, North Gower, Ontario. www.oavm.org sarawashbush@gmail.com
Nov. 28, 2007	Shakespeare Swine Seminar, Shakespeare, Ontario. Contact: Mary Van den Borre, (519) 846-3392, Fax: (519) 846-8178, mary.vandenborre@ontario.ca
Nov. 29, 2007	Ontario Association of Bovine Practitioners, Holiday Inn, Guelph, Ontario. Current techniques in bovine surgery and pain management. www.oabp.ca or contact Ruth Cudmore, oabpruth@qto.net
Nov. 30-Dec. 1, 2007	2007 International PRRS Symposium, Chicago, Illinois. www.prrssymposium.org
Dec. 1-5, 2007	American Association of Equine Practitioners 53rd Annual Convention, Gaylord Palms Resort and Convention Center, Orlando, Florida. www.aaep.org
Dec. 1-2, 2007	Ohio State University, 33rd Fall Food Animal Conference, Veterinary Teaching Hospital, 601 Vernon Tharp Street, Columbus, Ohio 43210 www.vet.ohio-state.edu/1053.htm
Dec. 5, 2007	"Big Bug Day" CPIC Swine Health Advisory Board, Arden Park, Stratford, Ontario. www.opic.on.ca/oshab.htm
Jan. 15-18, 2008	Banff Pork Seminar, Banff, Alberta. www.banffpork.ca

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Deadline for next issue: November 16, 2007

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